

THE AMENDMENT

In the Claims

1. (Withdrawn) A nucleic acid sequence encoding a polypeptide selected from the group consisting of TAF1B, MACS, UVRAG, ELAVL3, TCF6L1, ABCF1, AIM2, CHD2, FLJ11053, KIAA1052, ACVR2 and HT001 having a frameshift mutation, wherein the frameshift mutation is selected from the group consisting of:
 - a. the insertion of one A in the A11 repeats of the genes TAF1B, MACS, HT001, FLJ11053, KIAA1052,
 - b. the insertion of two A in the A11 repeats of the genes TAF1B, MACS, HT001, FLJ11053, KIAA1052,
 - c. the deletion of one A in the A11 repeats of the genes TAF1B, MACS, HT001, FLJ11053, KIAA1052,
 - d. the deletion of two A in the A11 repeats of the genes TAF1B, MACS, HT001, FLJ11053, KIAA1052,
 - e. the insertion of one A in the A10 repeats of the genes CHD2, UVRAG, TCF6L1, ABCF1, AIM2,
 - f. the insertion of two A in the A10 repeats of the genes CHD2, UVRAG, TCF6L1, ABCF1, AIM2,
 - g. the deletion of one A in the A10 repeats of the genes CHD2, UVRAG, TCF6L1, ABCF1, AIM2,
 - h. the deletion of two A in the A10 repeats of the genes CHD2, UVRAG, TCF6L1, ABCF1, AIM2,
 - i. the insertion of one A in the A8 repeat of the gene ACVR2,
 - j. the insertion of two A in the A8 repeat of the gene ACVR2,
 - k. the deletion of one A in the A8 repeat of the gene ACVR2,
 - l. the deletion of two A in the A8 repeat of the gene ACVR2,
 - m. the insertion of one G in the G9 repeat of the gene ELAVL3,
 - n. the insertion of two G in the G9 repeat of the gene ELAVL3,

- o. the deletion of one G in the G9 repeat of the gene ELAVL3, and
 - p. the deletion of two G in the G9 repeat of the gene ELAVL3.
- 2. (Withdrawn) The nucleic acid according to claim 1, wherein the nucleic acid is for use in detection of disorders associated with frameshift mutations in coding microsatellite regions or for use in preparation of pharmaceutical compositions for treatment of disorders associated with frameshift mutations in coding microsatellite regions.
- 3. (Currently Amended) A frameshift polypeptide ~~selected from the group consisting of:~~
 - ~~a. a frameshift polypeptide derived from a frameshift mutation as described in claim 1 in a coding microsatellite region of a gene selected from the group consisting of CHD2, UVRAG, ELAVL3, TCF6L1, ABCF1, AIM2, TAF1B, MACS and HT001;~~
 - ~~b. a polypeptide described by an amino acid sequence given in Figure 2;~~
 - ~~c. a polypeptide encoded by a nucleic acid sequence according to claim 1; and~~
 - ~~d. a fragment or a portion of the polypeptides of a) to c) containing at least one amino acid not present in the wild-type protein~~
encoded by a nucleic acid sequence having a frameshift mutation in TAF1B, MACS, HT001, FLJ11053, or KIAA1052 gene, wherein the frameshift mutation is selected from the group consisting of:
 - a. the insertion of one A in the A11 repeats,
 - b. the insertion of two A in the A11 repeats,
 - c. the deletion of one A in the A11, and
 - d. the deletion of two A in the A11 repeats.
- 4. (Previously Presented) The frameshift polypeptide according to claim 3, wherein the frameshift polypeptide is for use in detection of disorders associated with frameshift mutations in coding microsatellite regions or for use in preparation of pharmaceutical compositions for treatment of disorders associated with frameshift mutations in coding microsatellite regions.
- 5. (Withdrawn-Currently Amended) A method for treatment of disorders associated with frameshift mutations in coding microsatellites comprising administering one or more

frameshift polypeptides according to claim 3 ~~or nucleic acid sequences according to claim 1~~
in a pharmaceutical acceptable form to an individual.

6. (Withdrawn) The method of claim 5 additionally comprising administering one or more further frameshift polypeptides arising from frameshift mutations in coding microsatellite regions.
7. (Withdrawn-Currently Amended) The method according to claim 5, wherein the disorder is a degenerative disorder.
8. (Withdrawn) The method according to claim 5, wherein the disorder is a neurodegenerative disorder, vascular disease, cancer or precursory stages of cancer.
9. (Withdrawn) The method according to claim 5, wherein the treatment is immuno-therapeutic treatment of disorders.
10. (Withdrawn) The method according to claim 5, wherein the treatment is preventive vaccination against disorders.
11. (Currently Amended) A pharmaceutical composition comprising ~~a nucleic acid according to claim 1 or a~~ the polypeptide according to claim 3 in a physiological acceptable form.
12. (Withdrawn-Currently Amended) A method for detection of a disorder associated with frameshift mutations in coding microsatellite regions comprising detecting the presence or absence of one or more ~~nucleic acids according to claim 1 and/or~~ frameshift polypeptides according to claim 3 in a biological sample.
13. (Withdrawn) A method for detection of a disorder associated with frameshift mutations in coding microsatellite regions comprising detecting the presence or absence of antibodies directed against one or more frameshift polypeptides according to claim 3 in a biological sample.
14. (Withdrawn) A method for detection of a disorder associated with frameshift mutations in coding microsatellite regions comprising detecting the presence or absence of cells specifically directed against one or more frameshift polypeptides according to claim 3 in a biological sample.

15. (Withdrawn-Currently Amended) The method according to claim 12, wherein the disorder is a degenerative disorder.
16. (Withdrawn) The method according to claim 12, wherein the disorder is a neurodegenerative disorder, vascular disease, cancer or precursory stages of cancer.
17. (Currently Amended) A diagnostic or research kit comprising ~~one or more nucleic acids according to claim 1~~ or one or more polypeptides according to claim 3.
18. (Withdrawn) A method for treatment of disorders associated with peptides arising from frameshift mutations in coding microsatellite regions in individuals, comprising selecting a set of at least 5 different frameshift peptides according to the following requirements:
 - a. at least 3 of the frameshift peptides occur with a frequency of more than 30% in tissues affected by said disorders;
 - b. the frameshift peptides comprise each at least one novel amino acid residue compared to the wild-type amino acid sequence; and
 - c. the frameshift peptides comprise members of at least 3 different biochemical pathways;and administering said frameshift peptides to an individual either as peptide or in form of a nucleic acid to be expressed in situ in a pharmaceutical acceptable form that enables induction of an immune response in the individual against the peptides.
19. (Withdrawn) The method of claim 18, wherein at least one coding microsatellite sequence is represented by peptides originating from at least two different reading frames of said single microsatellite region.
20. (Withdrawn) The method according to claim 18, wherein at least one frameshift peptide is derived from a frameshift mutation in the (A)₁₀ tract of the TGF β RII gene.
21. (Withdrawn) The method according to claim 18, wherein at least one frameshift peptide is derived from a frameshift mutation in the (G)₈ tract of the BAX gene.
22. (Withdrawn) The method according to claim 18, comprising at least five frameshift peptides selected from the group consisting of frameshift peptides derived from the (A)₁₁

tract of the MACS gene, the (A)₁₀ tract of the CASP5 gene, the (A)₉ tract of the TCF-4 gene, the (G)₈ tract of the IGFIIR gene, the (T)₁₀ tract of the AC1 gene, the (A)₉ or (A)₁₀ tract of the SEC63 gene, the (A)₁₁ tract of the TAF1B gene, the (A)₁₁ tract of the PTHL3 gene, the (T)₁₄ tract of the U79260 gene, the (A)₁₀ tract of the AIM2 gene, the (A)₁₀ tract of the ABCF1 gene.

23. (Withdrawn) The method according to claim 18, wherein the set comprises frameshift peptides derived from mutations in the coding regions of the following genes: TGFβRII, U79260, CASP 5, HT001, PTHL3, MACS, TCF4, TAF1B, AC1 and SEC63
24. (Withdrawn) The method according to claim 18, wherein the set is selected from the group consisting of:

HT001	U79260	MACS	
HT001	TAF1B	MACS	
HT001	TGFB2R	MACS	
HT001	U79260	TGFB2R	
HT001	U79260	TAF1B	
HT001	TGFB2R	TAF1B	
HT001	U79260	TGFB2R	MACS
HT001	U79260	TGFB2R	AC1
HT001	U79260	TGFB2R	TAF1B
HT001	TGFB2R	MACS	CASP5
HT001	U79260	MACS	CASP5
HT001	U79260	MACS	AC1
HT001	TGFB2R	TAF1B	CASP5
HT001	U79260	MACS	OGT
U79260	TGFB2R	AC1	CASP5
HT001	U79260	TGFB2R	MACS AC1
HT001	U79260	TGFB2R	TAF1B MACS
HT001	U79260	TGFB2R	TAF1B AC1
HT001	U79260	TGFB2R	MACS AIM2

HT001	U79260	TGFB2R	TAF1B	AIM2
U79260	TGFB2R	TAF1B	AC1	CASP5
HT001	U79260	TGFB2R	AC1	CASP5
U79260	TGFB2R	MACS	AC1	CASP5
HT001	U79260	TAF1B	MACS	AC1
HT001	U79260	TAF1B	MACS	CASP5
HT001	U79260	MACS	AC1	OGT
HT001	U79260	MACS	MSH3	OGT
HT001	U79260	TGFB2R	MACS	OGT
HT001	TGFB2R	TAF1B	AC1	CASP5
HT001	U79260	TGFB2R	AC1	AIM2

25. (Withdrawn) The method according to claim 18, wherein the disorder is cancer or its precursory stages.
26. (Withdrawn) The method according to claim 25, wherein the cancer is colon cancer.
27. (Withdrawn) The method according to claim 18, which is immuno-therapeutic treatment of disorders.
28. (Withdrawn) The method according to claim 18, which is preventive vaccination against disorders.
29. (Cancelled)
30. (Currently Amended) A pharmaceutical composition comprising a set of at least three frameshift polypeptides according to claim 18 encoded by three genes each having a frameshift mutation in a coding microsatellite region, wherein said three genes are (a) HT001, TGFB2R, TAF1B, or (b) HT001, TGFB2R, MACS.
31. (Original) The pharmaceutical composition of claim 30, which is used for the treatment of cancer.
32. (Withdrawn-Currently Amended) A method for detecting a disorder associated with frameshift mutations in coding microsatellite regions in an individual comprising

- a. detecting the presence or absence and/or of the level of immunological entities specifically directed against ~~one or more frameshift polypeptides originating from frameshift mutations in coding microsatellite regions~~ the frameshift polypeptide according to Claim 3 in a biological sample, and
 - b. assessing diagnosis of the presence or absence of said disorder and/or prognosis of the disease course of said disorder from the presence or absence and/or the level of said immunological entities.
33. (Withdrawn) The method of claim 32, wherein the immunological entity is an antibody or a fragment thereof.
34. (Withdrawn) The method of claim 32, wherein the immunological entity is a cell specifically directed against a frameshift polypeptide.
35. (Withdrawn) The method of claim 32, wherein the disorder is a neuro-degenerative disorder or cancer.
36. (Withdrawn) The method of claim 35, wherein the cancer is gastrointestinal cancer.
37. (Withdrawn) The method of claim 32, wherein immunological entities are specifically directed against at least one frameshift polypeptide derived from a frameshift mutation in the (A)₁₀ tract of the TGF β RII gene.
38. (Withdrawn) The method of claim 32, wherein immunological entities are specifically directed against at least one frameshift polypeptide derived from a frameshift mutation in the (G)₈ tract of the BAX gene.
39. (Withdrawn) The method of claim 32, wherein immunological entities are specifically directed against at least one frameshift polypeptide selected from the group consisting of frameshift peptides derived from the (A)₁₁ tract of the MACS gene, the (A)₁₀ tract of the CASP5 gene, the (A)₉ tract of the TCF-4 gene, the (G)₈ tract of the IGFIIR gene, the (T)₁₀ tract of the AC1 gene, the (A)₉ or (A)₁₀ tract of the SEC63 gene, the (A)₁₁ tract of the TAF1B gene, the (A)₁₁ tract of the PTHL3 gene, the (T)₁₄ tract of the U79260 gene, the (A)₁₀ tract of the AIM2 gene, the (A)₁₀ tract of the ABCF1 gene.
40. (Withdrawn) The method of claim 32, wherein the detection is carried out in vitro.

41. (Withdrawn) The method of claim 32, wherein the detection is carried as an in situ immuno-cytochemical staining reaction.
42. (Withdrawn) A kit for performing the method of claim 32, which is a diagnostic kit or a research kit.
43. (New) A diagnostic kit comprising a set of at least three frameshift polypeptides encoded by three genes each having a frameshift mutation in a coding microsatellite region, wherein said three genes are HT001, TGFBR2, and TAF1B.